

### **ABSTRACT**

In a peritoneal dialysis embodiment of the present invention, spent dialysate from the patient's peritoneal cavity passes, along a patient loop, through a dialyzer having a membrane that separates waste components from the spent dialysate, 5 wherein the patient loop returns fresh dialysate to the patient's peritoneal cavity. The waste components are carried away in a second regeneration loop to a regeneration unit or sorbent cartridge, which absorbs the waste components. The regeneration unit removes undesirable components in the dialysate that were removed from the patient loop by the dialyzer, for example, excess water (ultrafiltrate or UF), toxins and 10 metabolic wastes. Desirable components can be added to the dialysate by the system, such as glucose and electrolytes. The additives assist in maintaining the proper osmotic gradients in the patient to perform dialysis and provide the necessary compounds to the patient.